REMARKS

In view of the above amendments and the following remarks, reconsideration of the outstanding office action is respectfully requested.

Initially, applicants would like to note that the present amendment is being submitted in compliance with "Amendments In A Revised Format Now Permitted", 1267 OG 4 (February 25, 2003). Pursuant to this notice, the requirements of 37 C.F.R. § 1.121 have been waived.

The U.S. Patent and Trademark Office ("PTO") has indicated that the application does not contain an abstract of the disclosure as required by 37 C.F.R. § 1.72(b). Applicants respectfully disagree. An abstract of the disclosure has been provided, as indicated on the first page of PCT International Application Number PCT/KR00/00580 (copy attached hereto as Exhibit A).

The rejection of claim 2 under 35 U.S.C. § 112, second paragraph, for indefiniteness is respectfully traversed in view of the above amendments.

The rejection of claims 1-9 and 12-20 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,156,690 to Hosaka ("Hosaka") is respectfully traversed in view of the above amendments and the following remarks. Support for the amendments to the claims and new claims 21-25 is found, for example, at page 5, lines 19-20, page 6, lines 29-31, page 7, lines 13-14, and page 7, lines 24-27 of the specification and original claims 2-3, 14-16, and 18.

Hosaka relates to a solid catalyst component for polymerization of olefins. The solid catalyst component is obtained by allowing a solid component and an alcohol to come in contact with each other. The solid component is first prepared by allowing a magnesium compound, a titanium compound, and an electron donor compound (e.g., an alcohol, phenol, ether, ester, ketone, acid halide, aldehyde, amine, amide, nitrile, isocyanate, or organic silicon compound) to come into contact with each other, preferably in the presence of a hydrocarbon.

In contrast, claim 1 (and its dependent claims 2-8 and 21) is directed to "[a] process for preparing polyolefin polymerization catalysts comprising the steps of: a) preparing a homogeneous magnesium solution by heating: i) magnesium compounds; ii) alcohols having 5 or more carbon atoms; and iii) a hydrocarbon solvents having 6 or more carbon atoms; b) preparing magnesium precipitates by sequentially adding alcohols having 5 or less carbon atoms to the homogeneous solution prepared in step a); c) adding primary organic aluminum compounds or alkylmagnesium halides to magnesium precipitates

prepared in step b); d) adding titanium compounds to magnesium precipitates that passed through step c); e) adding secondary organic aluminum compounds or electron donors to the magnesium precipitates that passed through step d); and f) filtering, washing, and drying the magnesium precipitate solution that passed through step e)" and claim 9 (and its dependent claims 10-20 and 22-25) is directed to "[a] process for preparing titanium catalysts for polyolefin polymerization comprising the steps of: a) preparing a homogeneous solution by agitating: i) magnesium compounds; ii) alcohols having 6 or more carbon atoms; and iii) hydrocarbon solvents; b) preparing a mixture by adding alcohols having 5 or less carbon atoms to the homogeneous solution prepared in step a); and c) contacting the mixture prepared in step b) with titanium halide compounds."

Hosaka neither discloses nor suggests "b) preparing magnesium precipitates by sequentially adding alcohols having 5 or less carbon atoms to the homogeneous solution prepared in step a)," as required by claim 1 and its dependent claims. Moreover, Hosaka neither discloses nor suggests "c) adding primary organic aluminum compounds or alkylmagnesium halides to magnesium precipitates prepared in step b)" and then "d) adding titanium compounds to magnesium precipitates that passed through step c)," as required by claim 1 and its dependent claims.

Further, Hosaka neither discloses nor suggests "preparing a homogeneous solution by agitating: i) magnesium compounds; ii) alcohols having 6 or more carbon atoms; and iii) hydrocarbon solvents," then "preparing a mixture by adding alcohols having 5 or less carbon atoms to the homogeneous solution prepared in step a)," and then "c) contacting the mixture prepared in step b) with titanium halide compounds," as required by claim 9 and its dependent claims.

In particular, Hosaka discloses detailed procedures for preparation of its solid component for use in a solid catalyst at col. 6, line 57 to col. 10, line 20. However, none of the methods disclosed in Hosaka teach or suggest the steps of preparing a homogeneous solution by heating magnesium compounds, alcohols having 5 or more carbon atoms, and hydrocarbon solvents having 6 or more carbon atoms, then preparing magnesium precipitates by adding alcohols having 5 or less carbon atoms to the homogeneous solution, and then adding titanium compounds to the magnesium precipitates, as required by claim 1 (and its dependent claims 2-8 and 21) of the present application. Moreover, none of the methods disclosed in Hosaka teach or suggest the steps of preparing a homogeneous solution by agitating magnesium compounds, alcohols having 6 or more carbon atoms, and hydrocarbon solvents, adding alcohols having 5 or less carbon atoms to the homogeneous solution, and

then adding titanium compounds to the mixture, as required by claim 9 (and its dependent claims 10-20 and 22-25) of the present application.

In contrast, with the methods of the present invention, a homogeneous solution can be prepared since a magnesium compound is easily dissolved at a high temperature when a mixture of hydrocarbon and alcohol having long alkyl groups is used (see, e.g., page 12, lines 14-26 of the specification). Then, an alcohol having carbon atoms of 5 or less is added to the prepared homogeneous solution to form a magnesium complex in which alcohols having short alkyl groups are substituted with alcohols having long alkyl groups, because the short alkyl groups have greater coordination powers with magnesium compound (see, e.g., page 6, line 29 to page 7, line 3 of the specification). The formed magnesium complex is more easily precipitated by the solubility difference between the long alkyl group compounds and the short alkyl group compounds (see, e.g., page 7, lines 4-6 of the specification). When the precipitate is contacted with a titanium compound, the average particle size of a catalyst is much greater and particle size distribution is more regular than those of catalysts in which alcohols having 5 or less carbon atoms are not added to a homogeneous solution of magnesium compounds (see, e.g., page 13, lines 20-25 of the specification). That is, the addition of alcohols having 5 or less carbon atoms before the reaction of a homogeneous solution and titanium compound has the effect of increasing average particle size of the finally prepared catalyst and making average size distribution regular (see, e.g., page 13, lines 26-31). Thus, the alcohols added to the homogeneous solution function as a particle size controlling agent. According to the present invention, particle size distribution of catalysts can be controlled by completely dissolving a magnesium compound and then precipitating it using an alcohol having 5 or less carbon atoms before reacting with a titanium compound, which enables control of particle size distribution of polymers.

Accordingly, the rejection based on Hosaka is improper and should be withdrawn.

The rejection of claims 10-11 under 35 U.S.C. § 103(a) as being unpatentable over Hosaka in view of U.S. Patent No. 5,459,116 to Ro et al. ("Ro") is respectfully traversed in view of the above amendments and the following remarks.

Ro relates to a catalyst for the polymerization of olefins. The catalyst is prepared by directly reacting a magnesium compound of liquid phase (for example, using an alcohol) having no reducing power with a titanium compound of liquid phase in the presence of at least one electron donor which comprises at least one hydroxy group and at least one ester group.

Ro does not cure the above-noted deficiencies of Hosaka and, accordingly, claims 10-11 are patentable over the cited art.

In view of all of the foregoing, applicants submit that this case is in condition for allowance and such allowance is earnestly solicited.

Respectfully submitted,

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(54) Title: PROCESS FOR PREPARING POLYOLEFIN POLYMERIZATION CATALYSTS

(57) Abstract: The present invention relates to a process for manufacturing polyolefin polymerization catalysts and provides a process for manufacturing polyolefin polymerization catalysts, wherein after manufacturing a homogeneous solution of magnesium compounds using magnesium compounds and alcohols along with hydrocarbon solvents and contacting with titanium compounds by adding organic aluminum, the mixture is treated again with organic aluminum or alcohols having 5 or less carbon atoms, then contacted with titanium compounds. Polyolefin polymerization catalysts prepared by the preparation process of the present invention have superior polyolefin polymerization activities, they prepare polymers having high Melt Flow Ratios, and produce a lesser amount of fine particle polymers.